CBRNIAC Newsletter
Chemical, Biological, Radiological & Nuclear Defense Information Analysis Center
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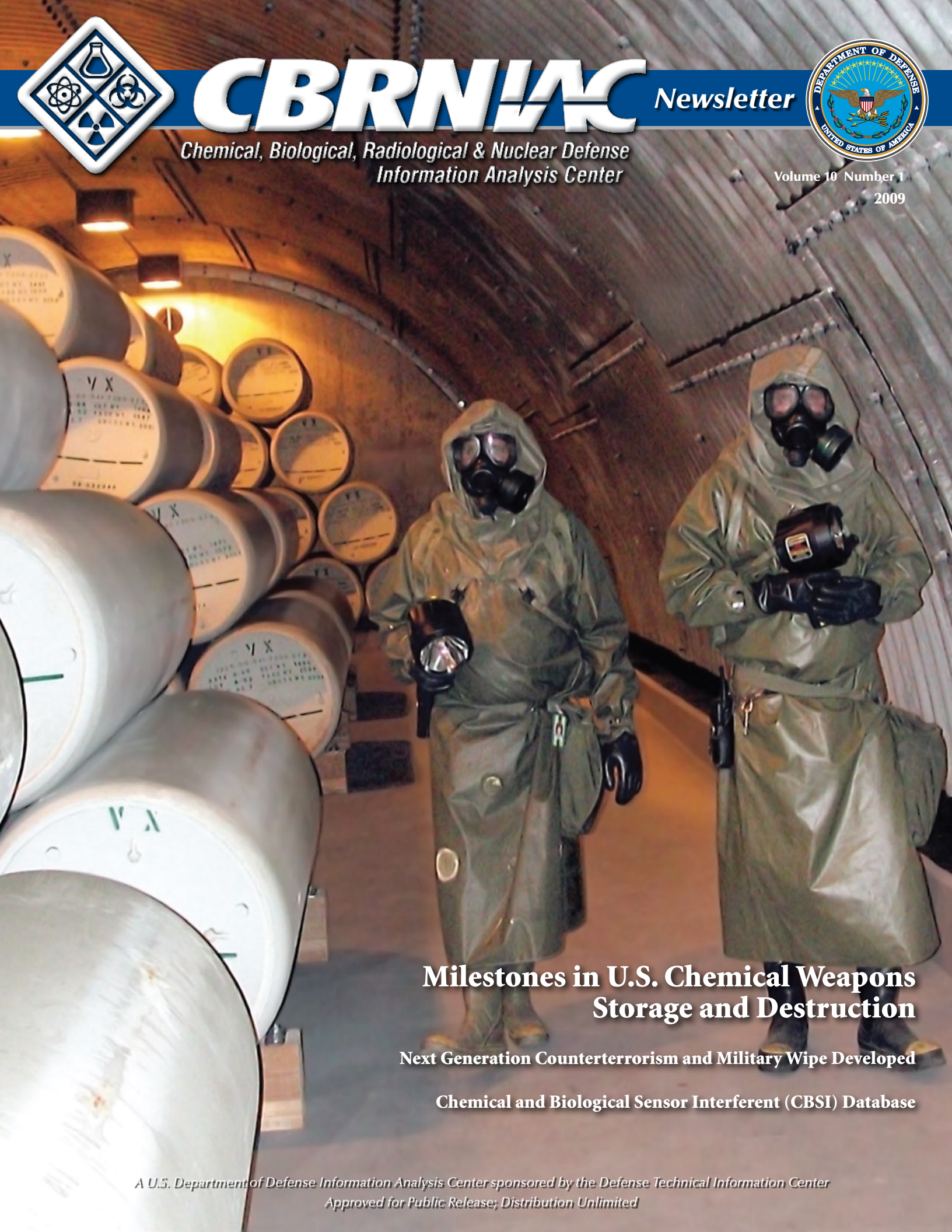

Milestones in U.S. Chemical Weapons Storage and Destruction

Next Generation Counterterrorism and Military Wipe Developed

Chemical and Biological Sensor Interferent (CBSI) Database

A U.S. Department of Defense Information Analysis Center sponsored by the Defense Technical Information Center
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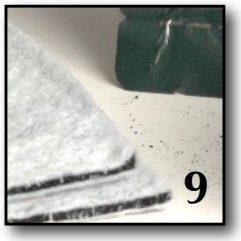

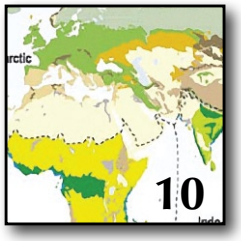

On the Cover: *Employees at the Newport Chemical Depot in Newport, Indiana, perform an inspection of steel containers of VX nerve agent. Newport successfully completed its chemical stockpile elimination mission August 8, 2008, when the VX contained in the last steel container was safely neutralized at the Newport Chemical Agent Disposal Facility.*

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The CBRNIAC welcomes unsolicited articles on topics that fall within its mission scope. All articles submitted for publication consideration must be cleared for public release prior to submission. The CBRNIAC reserves the right to reject or edit submissions. For each issue, articles must be received by the following dates:

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- Second Quarter (Number 2) – January 15th
- Third Quarter (Number 3) – April 15th
- Fourth Quarter (Number 4) – July 15th

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Milestones in U.S. Chemical Weapons Storage and Destruction

By Greg Mahall, Public Affairs, Chemical Materials Agency

With more than 2,600 dedicated employees plus contractor support staff, the U.S. Army Chemical Materials Agency (CMA) leads the world in chemical weapons destruction with a demonstrated history of safely storing, recovering, assessing and disposing of U.S. chemical weapons and related materials.

CMA manages all U.S. chemical materiel except for the disposal of two weapons stockpiles that fall under the Department of Defense's Assembled Chemical Weapons Alternatives (ACWA) pilot neutralization program. Through its Chemical Stockpile Emergency Preparedness Program (CSEPP), CMA works with local emergency preparedness and response agencies at weapons stockpile locations.

1960s and before – The United States began stockpiling and using chemical weapons against Germany in World War I. The weapons are securely stored at U.S. military installations at home and abroad.

Stored chemical weapons

1970s – The Army develops environmentally sound chemical weapons disposal methods using incineration and chemical neutralization. Project Eagle incinerates 6 million pounds of mustard agent and neutralizes 8 million pounds of nerve agent GB (sarin) at Rocky Mountain Arsenal, Colorado.

1971 – The United States transfers chemical munitions from Okinawa, Japan, to Johnston Island, located about 800 miles from Hawaii.

1972 – The Army forms the U.S. Army Materiel Command's Program Manager for Demilitarization of Chemical Materiel.

Organization relocates to Maryland

1973 – The organization relocates to the Edgewood Area of Aberdeen Proving Ground (APG), Maryland.

1975 – Organizational name is changed to Department of the Army Project Manager for Chemical Demilitarization and Installation Restoration.

1978 – Organizational name is changed to U.S. Army Toxic and Hazardous Materials Agency (USATHAMA).

1979 – The Army constructs and begins operating the Chemical Agent Munitions Disposal System, a pilot incineration facility located at what is now the Deseret Chemical Depot (DCD), Utah. The Army tests disposal equipment and processes at the plant. More than 91 tons of chemical agent are safely destroyed.


Pilot incineration facility in Utah

1981 – The United States constructs binary chemical weapons production facilities at Pine Bluff Arsenal (PBA), Arkansas. Binary chemical weapons were designed to mix two non-lethal chemicals in flight to a target to form nerve agent. The binary weapons program leads to chemical weapons elimination talks between the United States and the Soviet Union later in the decade.


Pine Bluff Integrated Binary Production Facility

1986 – Public Law 99-145 requires the safe destruction of the U.S. unitary chemical weapons stockpile. It also requires disposal facilities to be cleaned, dismantled and disposed of according to applicable laws and regulations. The stockpile is stored at eight military installations within the continental United States and at Johnston Island in the Pacific Ocean.

USATHAMA's chemical weapons management functions are split off to become the Program Manager for Chemical Munitions (Demilitarization and Binary). USATHAMA becomes the U.S. Army Environmental Center.

1988 – The Army and the Federal Emergency Management Agency establish the CSEPP in response to Public Law 99-145 calling for added public protection. Although the new law reflects a greater awareness of the need to be prepared for a possible chemical accident, the Army's storage and maintenance of the stockpile has been and continues to be operated safely.


A CSEPP training exercise

Continued pg. 5

Pine Bluff Arsenal

1988 — 1990 – The Army destroys BZ agent at PBA, Arkansas.

1989 – U.S. Secretary of State James Baker and former Soviet Union Foreign Minister Eduard Shevardnadze sign a Memorandum of Understanding (MOU) on chemical weapons in Jackson Hole, Wyoming. The MOU calls for cooperation and information exchange between the two countries concerning their chemical weapons capabilities. The two countries then sign an agreement to destroy much of their stockpiles. That agreement spurs international talks culminating in the international treaty known as the Chemical Weapons Convention (CWC). Organizational name is changed to Program Executive Officer-Program Manager for Chemical Demilitarization.

Memorandum of Understanding


U.S. Secretary of State James Baker *Soviet Union Foreign Minister Eduard Shevardnadze*

Construction begins on Tooele Chemical Agent Disposal Facility (TOCDF) at DCD, Utah.

1990 – The Army's prototype full-scale disposal facility, Johnston Atoll Chemical Agent Disposal System (JACADS), begins destruction of the stockpile on Johnston Island. The island's stockpile accounts for more than 6 percent of the nation's original stockpile.

Chemical weapons from West Germany and a small number of recovered World War II-era chemical weapons from the Solomon Islands are shipped to Johnston Island.


First full-scale disposal facility, JACADS, begins destruction in 1990

Organizational name is changed to Program Manager for Chemical Demilitarization (PMCD). The United States halts all binary weapons programs in accordance with the American-Soviet MOU.

1991 – Congress expands its chemical weapons destruction directive to include the disposal of non-stockpile materiel—items that are not part of the unitary chemical weapons stockpiles.

1992 – The U.S. Army Chemical Materiel Destruction Agency is established to consolidate responsibility for the destruction of chemical materials into one office.

Non-stockpile materiel items


Recovered M139 bomblet *Recovered 4.2-inch mortar*

In compliance with Public Law 102-484, the Army creates the Non-Stockpile Chemical Materiel Project (NSCMP) to develop systems to safely assess, treat and destroy five categories of chemical warfare materiel not part of the declared stockpile: binary chemical warfare materiel, former chemical weapons production facilities, miscellaneous chemical warfare materiel, buried chemical warfare materiel and recovered chemical warfare materiel.

Public Law 102-484 establishes Citizens' Advisory Commissions at each continental U.S. stockpile location. The state governor appoints seven members, with two more members from state government agencies responsible for chemical disposal program oversight.

1994 – The U.S. Army Chemical Materiel Destruction Agency is renamed the U.S. Army Chemical Demilitarization and Remediation Activity (CDRA) and placed under the U.S. Army Chemical and Biological Defense Command (CBDCOM).


Citizens' Advisory Commission

The Army establishes the Alternative Technologies and Approaches Project to investigate alternatives to incineration technology for the safe disposal of bulk chemical agent stockpiles at APG, Maryland, and Newport Chemical Depot (NECD), Indiana.

1995 – CDRA is separated from CBDCOM and renamed PMCD.

CSEPP is restructured to streamline procedures and enhance operational responsiveness.

1996 – TOCDF at DCD in Utah, with about 44 percent of the nation's original stockpile of nerve and blister agents, begins destroying chemical weapons. Storage and maintenance of the entire U.S. stockpile continues to be carried out safely.


Chemical Weapons Convention

1997 – The United States ratifies the CWC, agreeing to dispose of its unitary chemical weapons stockpile, binary chemical weapons, recovered chemical weapons and former chemical weapons production facilities.

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Milestones *cont.*

Public Law 104-208 funds a new, separately managed pilot program to identify and demonstrate alternatives to incineration technology for the disposal of assembled chemical weapons. The law establishes the Program Manager Assembled Chemical Weapons Assessment.

The pilot program is intended to provide alternative disposal technology for the stockpiles at Blue Grass Chemical Depot, Kentucky, and Pueblo Chemical Depot, Colorado.

Construction begins on the Anniston Chemical Agent Disposal Facility (ANCDF) at Anniston Army Depot (ANAD), Alabama, and on the Umatilla Chemical Agent Disposal Facility (UMCDF) at Umatilla Chemical Depot (UMCD), Oregon.

1999 – Construction begins at Aberdeen Chemical Agent Disposal Facility (ABCDF) at APG, Maryland.

ABCDF construction begins

NSCMP meets CWC requirement to destroy two categories of binary weapons components known as "excess other components" and "parity other components." Construction begins at Pine Bluff Chemical Agent Disposal Facility (PBCDF) at PBA, Arkansas.

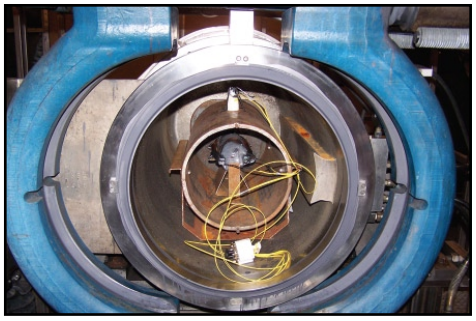
Last mine destroyed at JACADS

2000 – JACADS completes destruction of its chemical weapons stockpile, making it the first stockpile facility to complete its mission. JACADS workers destroyed more than 412,000 chemical weapons.

Construction begins on the Newport Chemical Agent Disposal Facility (NECDF) at NECD, Indiana.

2001 – NSCMP's Rapid Response System (RRS) treats more than 700 Chemical Agent Identification Set (CAIS) items stored at DCD, Utah. CAIS consist of glass vials, bottles and ampoules containing small amounts of chemical agent or industrial chemicals that were used for training purposes.

NSCMP treats 10 sarin-filled bomblets recovered at Rocky Mountain Arsenal, Colorado, using the Explosive Destruction System (EDS). The EDS is a transportable system designed to provide safe and environmentally secure on-site treatment of chemical warfare materiel.



EDS treating round

The Army begins studies to accelerate disposal operations in response to the terrorist attacks of Sept. 11, 2001.

The United States meets the CWC treaty requirement to destroy 20% of the U.S. chemical weapons stockpile.

2002 – TOCDF completes destruction of all nerve agent GB (sarin) stored at DCD, Utah.

ANCDF completes disposal facility testing.

The Army announces plans to accelerate destruction of the chemical agent stockpiles at APG, Maryland, and NECD, Indiana. Redesign and construction of facilities to allow for accelerated disposal begins in Maryland and Indiana.

Public Law 107-248 directs management of chemical demilitarization activities in Colorado and Kentucky to the Program Manager Assembled Chemical Weapons Alternatives.

NSCMP meets the CWC 100 percent destruction deadline for miscellaneous chemical warfare materiel.

2003 – PMCD merges with the stockpile storage mission within the Army Soldier and Biological Chemical Command to form CMA. CMA is created to store, assess and dispose of chemical materials. The agency is also tasked to work with state and local emergency response agencies for emergency preparedness activities in communities near stockpile sites.

ANCDF begins disposing of chemical weapons stored at ANAD, which held 7 percent of the original U.S. chemical weapons stockpile.

ABCDF begins disposing of mustard agent stored in large steel bulk containers at APG, Maryland. The APG mustard stockpile accounted for 5 percent of the original U.S. chemical weapons stockpile.

NSCMP begins cleaning obsolete large steel bulk containers at the Pine Bluff Ton Container Decontamination Facility at PBA, Arkansas.

Pine Bluff Ton Container Decontamination Facility

NSCMP completes a successful EDS mission to treat World War I-era chemical weapons recovered in Washington, D.C.

The United States meets the CWC treaty requirement to destroy 80 percent of its chemical weapons production capacity.

2004 – UMCDF begins disposing of chemical weapons stored at UMCD, which held 12 percent of the original U.S. chemical weapons stockpile.

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TOCDF and ABCDF reach 50 percent destruction milestones for munitions and bulk agent, respectively.

Preparing rockets for transport at Umatilla

The Single CAIS Access and Neutralization System (SCANS) performs its first treatment of a CAIS item at Fort McClellan, Alabama. SCANS is a mobile, single-use device for accessing and treating individual CAIS items containing the chemical agents mustard or lewisite.

NSCMP begins testing its Munitions Assessment and Processing System at APG, Maryland. The facility will treat chemical and acidic smoke munitions recovered in Maryland.

NSCMP successfully treats a WWI-era mustard-filled round at Dover Air Force Base (AFB), Delaware—the first of a number of Dover missions in ensuing years to destroy recovered WW I-era weapons. The EDS also completes a successful mission at Dugway Proving Ground, and NSCMP completes a successful SCANS mission at Holloman AFB, New Mexico.

2005 – ABCDF destroys all drained mustard agent from the APG stockpile.

Last TC at ABCDF

TOCDF destroys its millionth chemical agent munition at DCD, Utah. No other U.S. site will accomplish this. Only DCD had more than a million munitions in its stockpile.

Positioning a weapons transport container at PBCDF

PBCDF begins disposal operations. PBA stored 12 percent of the original U.S. chemical weapons stockpile.

NECDF begins disposal operations of nerve agent VX stored in large steel bulk containers. NECD held 4 percent of the original U.S. chemical weapons stockpile.

NSCMP opens the Binary Destruction Facility at PBA, Arkansas, to destroy the nation's remaining inventory of binary precursor chemicals DF and QL.

2006 – Treaty inspectors with the Organisation for the Prohibition of Chemical Weapons verify the complete destruction of ABCDF's hydrolysate at DuPont, marking the official 100 percent destruction of the APG stockpile. Demolition of all ABCDF buildings not held for other uses is completed.

Treaty inspectors verify that the former chemical warfare production facility at NECD has been destroyed.

The Army destroys 50 percent—more than 1.7 million—of the munitions in the original U.S. chemical weapons stockpile.

At PBA, workers finish chemically neutralizing the entire U.S. supply of precursor chemical agents DF and QL.

The non-stockpile RRS completes its CAIS destruction mission at PBA. The RRS destroyed more than 5,300 CAIS items during this operation.

TOCDF begins destroying mustard agent— the last remaining agent stockpiled at DCD. All nerve agent weapons have been safely and completely destroyed.


The RRS treats CAIS items under strict environmental controls

2007 – Newport Chemical Depot begins safe shipment of NECDF caustic wastewater to Veolia Environmental Services in Port Arthur, Texas, for final treatment and disposal.

CWC treaty 45 percent U.S. chemical agent destruction milestone achieved.

ABCDF completes Resource Conservation and Recovery Act closure, becoming the first U.S. chemical demilitarization site to achieve permitted closure.

CMA officials, Veolia Environmental Services' work force and Tri-State Motor Transit drivers celebrate a half million miles safely driven—achieved transporting wastewater from the NECDF in Newport, Indiana, to Veolia's Port Arthur, Texas, waste treatment plant.

Last VX nerve agent-filled spray tank in the U.S. chemical weapons stockpile destroyed.

Safe destruction of 50 percent of U.S. chemical agent stockpile achieved.

2008 – Last M55 rocket in CMA disposal mission destroyed, reducing cumulative storage risk to public by 94 percent.

PBCDF destroys the final VX-filled M23 landmine—the last nerve agent-filled munition in the PBA stockpile.

NECDF completes its bulk nerve agent VX disposal mission, and shipment of the resulting caustic wastewater for final treatment and disposal.

The last TC of the Newport Chemical Depot stockpile is ready for delivery to the Newport Chemical Agent Disposal Facility

December 24, 2008, CMA's Anniston facility eliminates the last of its VX, the last VX slated for destruction in the CMA stockpile.

The only nerve agent remaining is a minute amount of GA (tabun) at Utah with all other nerve agents under CMA storage mission at Blue Grass, Kentucky.

Blue Grass will see its stockpile disposed under DoD's Assembled Chemical Weapons Alternatives program.

Contract Awards

Chemical Sensor Program
Johns Hopkins University – Applied Physics Laboratory
Laurel, MD
$8,370,480 December 19, 2008
By Defense Advanced Research Projects Agency, Arlington, VA

Joint Chemical Agent Detector
Smiths Detection
Edgewood, MD
$65,000,000 December 19, 2008
By Department of Defense, Washington, DC

Investigation of Post-Radiation Pill: Eltrombopag
University of Rochester
Rochester, NY
$3,180,000 December 15, 2008
By Biomedical Advanced Research and Development Authority, Washington, DC

(Up to) 54 Additional AN/TMQ -52 Meteorological Measuring Set-Profiler Systems
Smiths Detection
Edgewood, MD
$19,305,884 December 11, 2008
By CECOM Acquisition Center, Fort Monmouth, NJ

Joint Chemical Detector
Smiths Detection, Inc.
Edgewood, MD
$65,498,978 December 9, 2008
By US Army RDECOM Acquisition Center, Aberdeen Proving Ground, MD

Institute for Collaborative Biotechnologies
University of California, Santa Barbara
Santa Barbara, CA
$65,580,000 December 3, 2008
By RDECOM Acquisition Center, Research Triangle Park, NC

Individual Protection Equipment Mannequin System: The Integrated IPE Mannequin, Exposure Chamber, Exposure Chambers Ingress/Egress Support and Control Room
Midwest Research Institute
Kansas City, MO
$7,967,779 November 26, 2008
By U.S. Army Research Development & Engineering Command Acquisition Center, Aberdeen, MD

Develop Biotic Man: Design of a Computer Model That Could Dramatically Speed Drug Design in Response to the Threat of Biological Attacks on the Battlefield or in Domestic Situations
GE Global Research
Niskayuna, NY
$1,100,000 November 20, 2008
By Defense Threat Reduction Agency, Fort Belvoir, VA

Hand-Held Chemical Detectors
Sensor Research and Development Corporation
Orono, ME
$750,130 November 10, 2008
By Naval Surface Warfare Center, Dahlgren, VA

Anthrax Detection Equipment
Universal Detection Technology
Los Angelos, CA
$ Not Found October 17, 2008
By U.S. Army Corps of Engineers, Washington, DC

Support Ongoing Development of Broad Spectrum Chemical Nerve Agent Countermeasure, Protexia®
PharmAthene, Inc.
Annapolis, MD
$1,600,000 October 15, 2008
By Department of Defense, Washington, DC

Provide an Enterprise-Wide, Integrated Information Management Solution to Accommodate the Management of BNBI Documents, Records, Compliance, and Improvement Actions to Manage the Risk of Bioterror and Bio Crime in the U.S.
Merlin International
Washington, D.C.
$ Not Found October 15, 2008
By Battelle National Biodefense Institute, Frederick, MD

Modification for the Balance of Construction of the Pueblo Chemical Agent Destruction Pilot Plant
Bechtel National, Inc.
San Francisco, CA
$563,473,000 October 15, 2008
By U.S. Army Sustainment Command, Rock Island, IL

Model, Design and Development of a Novel Sensor Inspired by a Canine's Olfactory System
Evolved Machines Federal Contracting Inc
West Palm Beach, FL
California Institute of Technology
Pasadena, CA
Cogniscent
North Grafton, MA
iSense
Urbana, IL
Monell
Philadelphia, PA
Northrop Grumman
Baltimore, MD
Penn State University
State College, PA
University of Miami
Miami, FL
$8,884,907 October 15, 2008
By Defense Advanced Research Projects Agency, Arlington, VA

Next Generation Counterterrorism and Military Wipe Developed

by John Davis, Texas Tech University

A newly developed decontamination wipe designed by researchers at The Institute of Environmental and Human Health (TIEHH) at Texas Tech University has proven itself the best for cleaning up chemical warfare agents and toxic chemicals.

Seshadri Ramkumar with the nonwoven wipe

The evaluation of the nonwoven dry wipe product, called Fibertect™, was performed as part of a study by the Lawrence Livermore National Laboratory using mustard gas and other toxic chemicals. Researchers found that the Texas Tech-created product outperformed 30 different decontamination materials, including materials currently used in military decontamination kits.

The results are published online today (Dec. 3) in the American Chemical Society's peer-reviewed journal, *Industrial & Engineering Chemistry Research* and titled, "Next Generation Non-particulate Dry Nonwoven Pad for Chemical Warfare Agent Decontamination."

This news comes after a blue-ribbon Congressional panel has recently concluded that it's likely that terrorists will use a weapon of mass destruction somewhere in the world by 2013.

By developing this product, TIEHH is meeting the specific needs of today's military as expressed in a 2004 report to Congress published by the U.S. Department of Defense. In this and the March 2005 annual report, the Department called for products such as this one to decontaminate people and military equipment as part of its Decontamination Science and Technology Modernization Strategy.

"These test results are another affirmation that Texas Tech researchers, particularly those working at The Institute of Environmental and Human Health, are some of the best in the world," said Kent Hance, chancellor of Texas Tech University System. "The new products developed from their research will help safeguard our troops against chemical hazards and assist emergency crews in cleanups from toxic accidents and environmental disasters."

Seshadri Ramkumar supervises the Nonwovens and Advanced Materials Laboratory at Texas Tech. He and other scientists with the Admiral Elmo R. Zumwalt Jr. National Program for Countermeasures to Biological and Chemical Threats have worked to create a product that will be an asset to military and homeland security efforts in the post-Sept. 11 environment. The program is funded by the U.S. Department of Defense.

"Needlepunch nonwoven technology has been used to develop this flexible, absorbent and adsorbent material that can be used not only as a decontamination wipe, but also as the liner of protective suits, filters and masks," said Ramkumar, who served as the lead author for the study. "The material is flexible, doesn't contain loose particles and is capable of cleaning intricate parts of everything from the human body to the control panel of a fighter jet."

Texas Tech wipe (left) and Particulate M291 (right)

The product features an activated carbon core sandwiched between an absorbent layer on the top and the bottom, he said.

"Dr. Ramkumar and others have worked hard to make us a leading research institution by developing this innovative and necessary product," said Ron Kendall, director of TIEHH and a co-author for the report. "This new fabric will help protect our troops on the battlefield as well as Americans here at home against biological and chemical warfare and terrorism threats."

The technology has been licensed by Texas Tech's Office of Technology Commercialization to Waco-based Hobbs Bonded Fibers. The company is organizing a global marketing team to expedite the commercialization of Fibertect™. The initial member of the team is The Bellator Group, which has a successful history of commercializing products into the military sector.

"The exciting news here is that the federal government saw a need for this product, and Texas Tech came up with a product to meet that need," said Carey Hobbs, president of Hobbs Bonded Fibers. "Now, the federal government is going to see an actual return on its money. You can buy this product today, and we're already manufacturing and exhibiting it to people in the marketplace."

The Institute of Environmental and Human Health develops environmental and health sciences research and education at Texas Tech University and Texas Tech Health Sciences Center. For more information on the development of the wipe, contact Seshadri Ramkumar, associate professor at The Institute of Environmental and Human Health at Texas Tech University, (806) 445-1925 or s.ramkumar@ttu.edu.

Hobbs Bonded Fibers has been one of North America's most innovative and technically advanced fiber processing companies since 1953. For more information on the wipe production, contact Carey Hobbs, president of Hobbs Bonded Fibers, at (254) 741-0040, or carey@hobbsbondedfibers.com.

Press release dated December 3, 2008. Photos by Artie Limmer.

Chemical and Biological Sensor Interferent (CBSI) Database

By John Campo, CBRNIAC Information Systems Manager

The Biodefense Group at Massachusetts Institute of Technology Lincoln Laboratory (MIT LL) participated in a Defense Threat Reduction Agency (DTRA)-funded program to document the abundance of naturally occurring materials that negatively impact the performance of deployed chemical and biological (CB) sensors. In a joint venture, MIT LL teamed with the Chemical, Biological, Radiological and Nuclear Defense Information Analysis Center (CBRNIAC) to develop the Chemical and Biological Sensor Interferent (CBSI) Database.

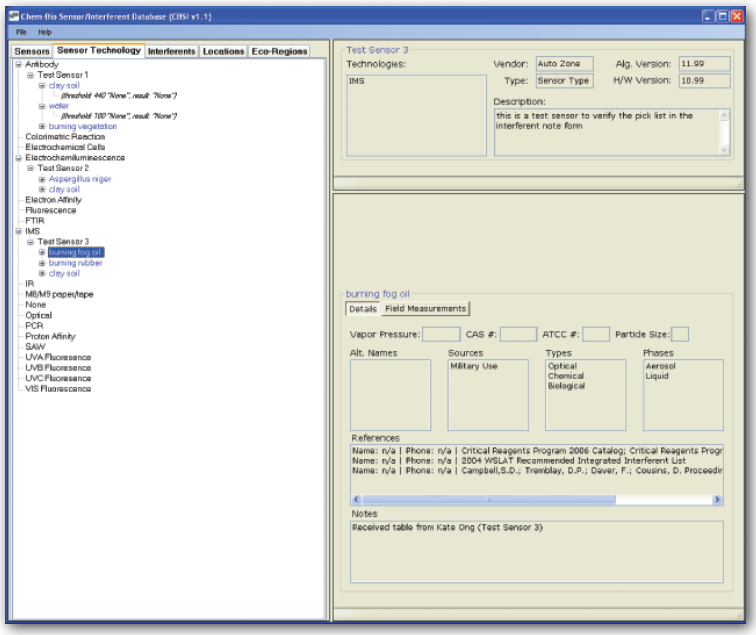
CBSI links environmental measurements of abundances of naturally occurring materials that have been either confirmed or suspected to interfere with deployed DoD chemical and biological detection technologies. Entries have been culled from open sources and from subject matter experts in the DoD CBRN community. Citation information to primary sources of data and/or points of contact is provided for all entries.

CBSI users can navigate to information via five different paths – Sensor, Sensor Technology, Interferent, Location, and Eco-Region. Each of these entry points is represented by a tab on the upper left portion of the main page.

Sensors

The Sensor screen displays a hierarchical tree of sensors and applicable interferents with measured thresholds. For the selected sensor, sensor detail information appears in the upper right portion of the page. For the selected interferent, detailed interferent information and any field measurements of that material will appear in the lower right portion of the page.

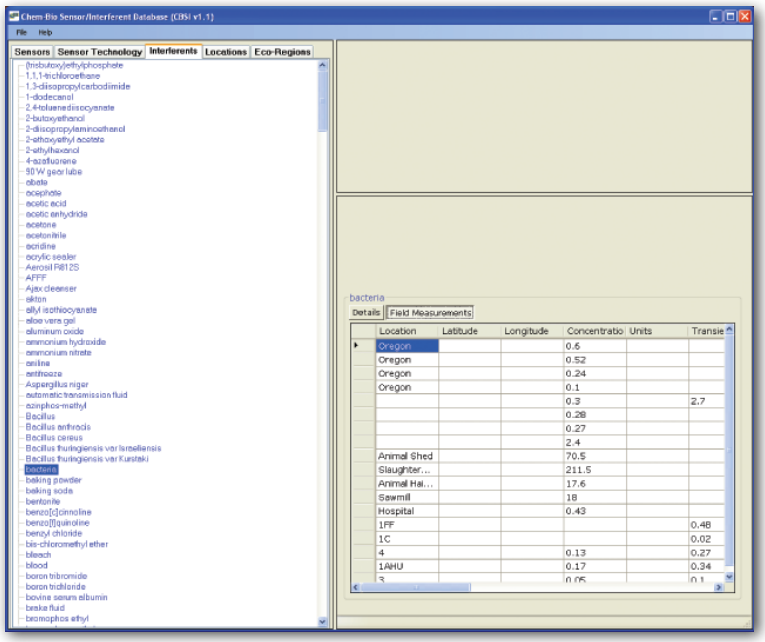
Sensor Technology



The Sensor Technology screen displays a hierarchical tree of sensor technologies, related sensors, and applicable interferents with measured thresholds. For the selected sensor, sensor detail information appears in the upper right portion of the page. For the selected interferent, detailed interferent information and any field measurements of that material will appear in the lower right portion of the page.

Interferents

The Interferents screen displays a list of known and potential interferent materials. Detailed interferent information and any field measurements of that material will appear in the lower right portion of the page.



Locations

The Locations screen displays a hierarchical tree of locations and measured interferents. For the selected location and interferent, detailed interferent information and any field measurements of that material will appear in the lower right portion of the page.

Eco-Regions

The Eco-Regions screen displays a hierarchical tree of Eco-Regions. For the selected Eco-Region and interferent material, detailed interferent information and any field measurements of that material will appear in the lower right portion of the page.

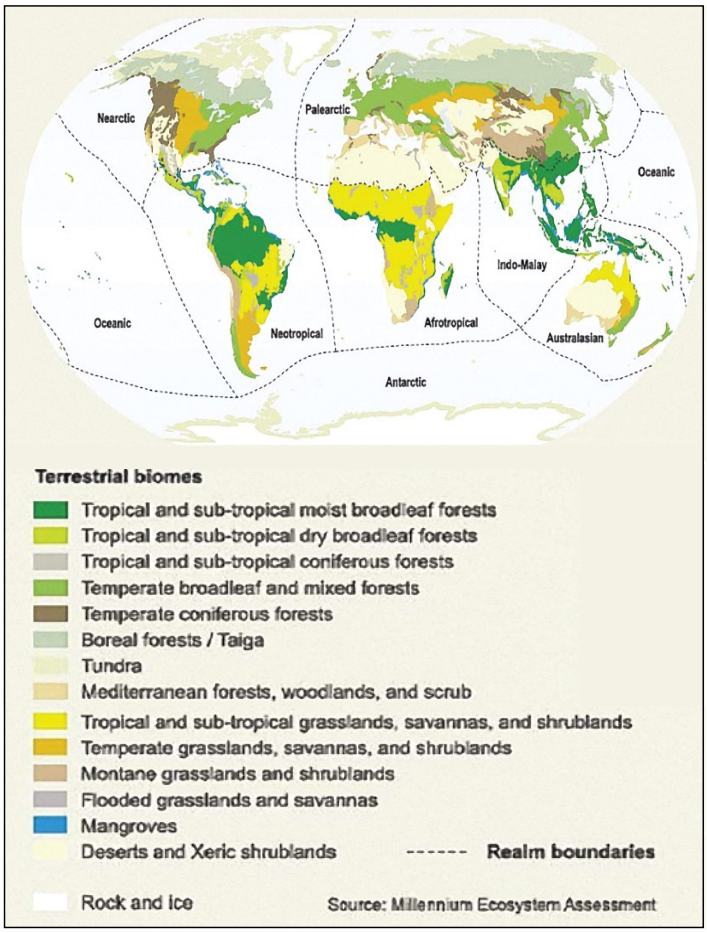
Ecological Location Indexing

Measurement locations are catalogued using the biogeographical ecosystem classification developed by Udvardy in 1975. An eco-region is an ecologically and geographically defined area with characteristic, geographically distinct biological communities. The ecological description is classified according to the biome system, which is primarily based on climate and vegetation (i.e.,

Continued pg. 11

CBSI *cont.*

forests, grasslands, etc.). The geographical description is classified into eight biogeographical realms, which roughly correspond to continents and which represent the major terrestrial flora and fauna communities. CBSI indexes entries first by biome, and secondarily by bio-geographical realm.



CBSI was developed with Microsoft C# .Net and uses Microsoft SQL Server Compact Edition on the back end. CBSI runs on Microsoft Windows XP SP2 and requires the Microsoft .Net Framework 2.0.

An initial prerelease of CBSI was completed in March 2008. CBSI Version 1.1 will be offered to the chemical and biological defense community, to CB sensor and assay developers, and to CB sensor end-users for purchase as a classified, limited distribution CBRNIAC product in May 2009.

For more information about CBSI or how your organization can participate in further development or population of this tool, contact the CBRNIAC at cbrniac@battelle.org or John Campo at campo@battelle.org

About the Author

John Campo, PMP, is an IT Project Manager at the Battelle Eastern Science and Technology (BEST) Center in Aberdeen, MD. Mr. Campo has provided IT support for the CBRNIAC for the past 13 years as both a software engineer and project manager.

CBRN Live Radiation Exercise

by Carolyn Erickson, GUIDON staff

3rd Chemical Brigade units joined forces to train in chemical, biological, radiological and nuclear defense with a live radiation source for the first time on Fort Leonard Wood, Nov. 26, 2008.

"This is the first time we've used live radiation in training here on Fort Leonard Wood," said Maj. Bryon Galbraith, CBRN Basic Officer Leadership Course chief.

Using live radiation in training allowed the Soldiers to calculate the dose rate and perform other critical mathematical equations that training, or fake, radiation emitters do not permit, said Eric Hanson, 84th Chemical Battalion Training and Tactics Division health physicist.

The exercise planners built in many safeguards during the training to ensure Soldier safety with live radiation. They used the radiation exposure principle of As Low As Reasonably Achievable to govern their mission planning, Hanson said.

"They (the Soldiers) are receiving thousands times less radiation than a chest x-ray," Hanson said. "They have electronic personal dosimetry, so we can tell their whole body exposure. If we see their dose is increasing, we pull them out."

The exercise used Cesium 137 and Cobalt 60 as radiation sources, said Sgt. 1st Class Nasario Martinez, 84th Chemical Battalion Training and Tactics Division instructor. Isotopes are variations of the elements in the periodic table. As isotopes, they are unstable, and as they try to become more stable, they emit radiation, Hanson said.

"Each source isotope has its own energy (signature), so the instrument (the lieutenants) are using can identify the source," Hanson said.

"They can apply the laws of physics so they can figure out time, distance and shielding," Hanson continued. "They can apply all the math rules of measuring isotopes… and calculate their operational exposure times."

The mission was to clear a village, and locate, identify, sample and contain CBRN hazards.

"In the biolab, in this scenario, (the lieutenants) have intelligence that there are chemical weapons being produced, two 55-gallon drums of chemical agents that are precursors to chemical weapons and radiation sources," Hanson said. "Intelligence told them what isotopes (are there), so they could do the math beforehand. All that's left to do is find the source."

Company E, 3rd Battalion, 10th Infantry Regiment, performed route and site clearance in preparation for the CBRN operation. Fox vehicle course personnel provided technical assistance in the mission, while CBRN BOLC Class 05-08 took the lead on the training.

"They're (1 squad) going to move through the area, enter, clear and secure the objective, (while another) squad will do route clearance to identify IEDs and report the information to (the lieutenants)," said Sgt. 1st Class Chris Martinez, Co. E executive officer.

The Soldiers, who were on a field exercise of their Initial Entry Training company, cleared the village wearing gear that registered "shots" fired, and if they were "hit," they had "enemy forces" that fought back, and Martinez added a CBRN element by tossing a few CS grenades and artillery simulators.

Next, the Fox reconnaissance vehicles drove by the 55-gallon drums and "biolab" to take readings. The crew then called their findings back to the lieutenants.

"We (with the Fox) give them the ability of contamination avoidance," said SFC Howard Lovin, Co. A, 84th Chemical Battalion Training and Tactics Division, Fox vehicle noncommissioned officer in charge. "The Fox vehicles go in and identify the contaminant so (the lieutenants) can protect themselves against it."

After the village was cleared and the Fox vehicle team reported up any contaminants they found, the lieutenants began the process of locating, identifying, marking, sampling and containing the radiation sources.

Teams got in Level A suits, the suit with the highest level of protection available, and contained two drums of chemical weapons precursors. Next, teams entered the lab, cleared it, and located radiation sources. Finally, teams came in to "characterize the site" by marking suspicious areas so that the last team could sample the suspicious areas for further testing.

Three MEDDAC nurses performed medical checks on Soldiers before they put on Level A suits to ensure their safety. Also, the CBRN school physics team served as monitors, looking at time of exposure and dose levels of each Soldier.

Each group involved benefited from the training.

"It gives them some more real world training," Martinez said of his Initial Entry Training Soldiers.

The Fox vehicle crew said they were participating so the lieutenants could understand the CBRN assets available to them. Often, new CBRN officers do not fully understand all of their available equipment and its capabilities, Lovin said.

"We're here doing this because later on they're going to be our commanders," Lovin said. "These lieutenants are light years ahead of those 20 years ago."

Calendar of Events

Do you have a CBRN Defense or Homeland Security course or event to add to our Calendar? Submit the pertinent information via email to **cbrniac@battelle.org.** *The CBRNIAC reserves the right to reject submissions. For a more extensive list of events, view our online calendar at* **https://www.cbrniac.apgea.army.mil/Products/Events/Pages/default.aspx.**

May 3-7
Nanotech Conference & Expo 2009
Houston, TX
http://www.nsti.org/Nanotech2009/

May 3-8
COURSE: Medical Management of Chemical and Biological Casualties
Ft. Detrick and Aberdeen Proving Ground, MD
https://ccc.apgea.army.mil/courses/in_house/BrochureMCBC.htm

May 4-6
Late Health Effects of Ionizing Radiation
Washington, DC
http://lombardi.georgetown.edu/events/radconf09/index.htm

May 4-6
Fire-Rescue Med 2009 Conference & Expo
Las Vegas, NV
http://www.iafc.org/displaycommon.cfm?an=1&subarticlenbr=6

May 4-7
Environment, Energy & Sustainability Symposium and Exhibition
Denver, CO
http://e2s2.ndia.org/pages/default.aspx

May 5-7
2009 Joint Service Power Expo
New Orleans, LA
http://www.ndia.org/events/Pages/9670_2009JointServicePowerExpo.aspx

May 5-8
In-Situ and On-Site Bioremediation
Baltimore, MD
http://www.battelle.org/conferences/bioremediation/

May 6-7
Center for the Study of WMD Symposium 2009: Are We Prepared? Four WMD Crises That Could Transform U.S. Security
Washington, DC
http://www.ndu.edu/WMDCenter/index.cfm?secID=149&pageID=18&type=section

May 7-8
Joint Program Executive Office for Chemical and Biological Defense APBI
Washington, DC
http://www.ndia.org/events/Pages/9370_JPEOforChemicalAndBiologicalDefenseAPBI.aspx

May 12-15
Security Solutions 2009
Tampa, FL
https://securitysolutions.telos.com/default.cfm

May 13-14
Border Security Expo
Phoenix, AZ
http://www.bordersecurityexpo.com/

May 13-14
Managing the Threat of Suicide Bombers and Improvised Explosive Devices (IEDs) Workshop
Las Vegas, NV
http://www.homelanddefensejournal.com/Courses/2009Courses/Managing-Threat-Suicide-Bombers-IEDs_May09.html

May 13-15
CFEDWest Conference & Expo 2009
Palm Springs, CA
http://www.cfedwest.com/

May 17-21
American Society for Microbiology 109th General Meeting
Philadelphia, PA
http://gm.asm.org/

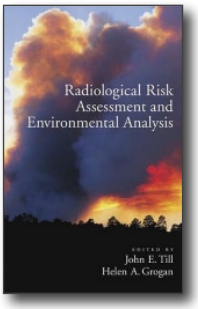
New CBRNIAC Information Resources

Research Advisory Committee on Gulf War Veterans' Illnesses. **Gulf War Illness and the Health of Gulf War Veterans: Scientific Findings and Recommendations**. Washington, D.C.: U.S. Government Printing Office, 2008.
http://sph.bu.edu/insider/images/stories/resources/annual_reports/GWI%20and%20Health%20of%20GW%20Veterans_RAC-GWVI%20Report_2008.pdf

"Gulf War illness, the multisymptom condition resulting from service in the 1990-1991 Gulf War, is the most prominent health issue affecting Gulf War veterans, but not the only one. The Congressionally mandated Research Advisory Committee on Gulf War Veterans' Illnesses has reviewed the extensive evidence now available… This evidence identifies the foremost causes of Gulf War illness, describes biological characteristics of this condition, and provides direction for future research urgently needed to improve the health of Gulf War veterans." *(Findings in Brief)*

CB-078194
Research Advisory Committee on Gulf War Veterans' Illnesses
Boston University School of Public Health
715 Albany Street (T-4W)
Boston, MA 02118
Phone: 617-414-1401

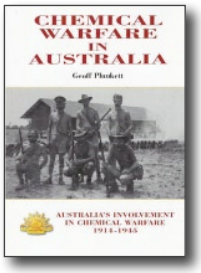
Grogan, Helen A., and John E. Till, editors. **Radiological Risk Assessment and Environmental Analysis**. New York: Oxford University Press, 2008.



"This textbook is an update and major revision of Radiological Assessment: A Textbook on Environmental Dose Analysis published by the U.S. Nuclear Regulatory Commission in 1983. Although the previous book made a unique contribution in bringing together different elements of radiological assessment as a science, a number of deficiencies were difficult to resolve at the time it was written… In this new book, we have tried to address some of these deficiencies." *(Preface)*

CB-074133
ISBN 978-0-19-512727-0
Oxford University Press, Inc.
198 Madison Avenue
New York, NY 10016
Phone: 212-726-6000

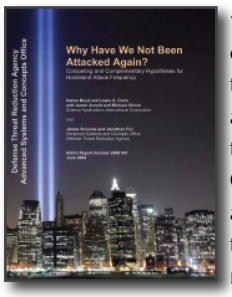
Plunkett, Geoff. **Chemical Warfare in Australia**. Loftus, Australia: Australian Military History Publications, 2007.



"Forced to counter the chemical warfare threat, Australia covertly imported about 1,000,000 chemical weapons – including 16 types of mustard gas – and hid them in tunnels and other sites around the country. This book tells the story of the importation, storage and 'live trials' of the deadly weapons…. This remarkable book contains over 300 photographs – many taken surreptitiously – that illustrate all too starkly the conditions and the danger… This is an unprecedented visual history." *(Inside Cover)*

CB-077568
ISBN 978-1-876439-88-0
Australian Military History Publications
13 Veronica Place
Loftus 2232 Australia
Phone: 0011 61 2-9542-6771

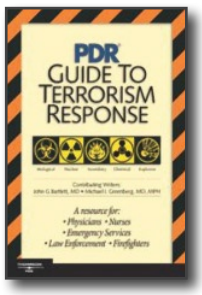
Boyd, Dallas, Lewis A. Dunn, Aaron Arnold, Michael Ullrich, James Scouras, and Jonathan Fox. **Why Have We Not Been Attacked Again? Competing and Complementary Hypotheses for Homeland Attack Frequency**. Fort Belvoir, VA: Defense Threat Reduction Agency, 2008.
http://www.heritage.org/Research/Features/NationalSecurity/upload/WeHaveNotBeenAttackedAgain.pdf



"This report examines a number of competing and complementary hypotheses that seek to explain the non-occurrence of a large-scale terrorist attack on the U.S. homeland since 9/11. While the study's title seems implicitly to ask why al-Qaeda has not succeeded in a second homeland attack, the analysis also considers groups within the broader radical Islamist movement as well as non-religious groups and lone individuals. Before examining the competing hypotheses, several terms and assumptions must be clarified, each of which is linked to the way that the report, as well as the individual theories, has posed the basic question: Why has the United States not been attacked since 9/11?" *(Executive Summary)*

CB-074588
Advanced Systems and Concepts Office
Defense Threat Reduction Agency
8725 John J. Kingman Road
Fort Belvoir, VA 22060-6201
Phone: 703-767-4974

Bartlett, John G., MD, and Michael I. Greenberg, MD, MPH. **PDR Guide to Terrorism Response**. Montvale, NJ: Thomson PDR, 2005.



"The PDR Guide to Terrorism Response is designed to quickly provide different professionals the information they need in just the right amount of detail to do their jobs decisively and effectively in the event of a terrorism attack." *(How to Use This Book)*

CB-073762
ISBN 1-56363-550-X
Thomson PDR
5 Paragon Drive
Montvale, NJ 07645-1725
Phone: 201-358-7200

History of Army Chemical and Biological Decontamination – Part III

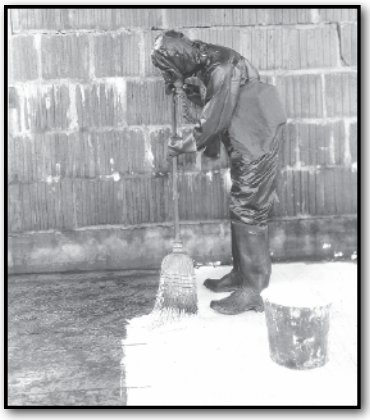
By Jeffery K. Smart, U.S. Army Research, Development and Engineering Command Historian

This article is Part III of a series of articles extracted from the ***History of Army Chemical and Biological Decontamination***, by Mr. Jeffery K. Smart, U.S. Army Research, Development and Engineering Command (RDECOM) Historian, July 2007. This presentation is edited, with permission of the author, for the ***CBRNIAC Newsletter*** forum.

BETWEEN THE WORLD WARS

Decontaminating Agents

Bleach



Throughout the 1920s, bleaching powder remained the number one decontaminant for mustard agent. This was confirmed in 1926 with the preparation of an Army specification for bleaching powder. The Chemical Warfare Service continued to work on finding a better decontaminant for mustard agent since bleach was corrosive to metals, damaging to material and leather, and had only a three-week storage life in the tropics. In 1933, the Army prepared a new specification for bleach that identified three different grades suitable for decontamination.

Grade A, also known as High Test Bleach (HTH) or Penchlor, was calcium hypochlorite that contained 70% available chlorine. Although identified in 1933, it was not standardized until 1941 and then only for tropical use. Grade A, however, was expensive and not readily available. During World War II it was needed for higher priority work than decontamination, so it was redesignated a limited standard item in 1942. Grade A bleach was obsoleted in 1945.

Ordinary bleaching powder, containing at least 35% available chlorine, was standardized in 1933 and designated Grade B. It was cheap, effective, and readily available commercially. The major problem with Grade B was that it deteriorated rapidly in the tropics. Since Grade A, standardized during World War II to compensate for this problem, proved to be unavailable in large amounts, Grade B was reclassified limited standard in 1944 after the development of improved bleach material. Grade B was obsoleted in 1945.

Grade C was identified in 1933, but not standardized until 1944 and then only as a limited standard article to replace Grade A even though Grade C deteriorated in the tropics. It was essentially the same material as Grade B, but contained only 30% available chlorine. When Grade B was transferred from large storage containers into smaller containers, the bleach lost enough chlorine to make it Grade C. Grade C bleach was obsoleted in 1945.[14]

DR1 Decontaminant

The need for a decontaminant for Navy ships during the early 1930s led to the development of DR1 emulsion. Although water washed away mustard agent, it did not neutralize it. Research determined that adding different ingredients to the water helped neutralize the agent. DR1 was one of the earliest decontaminants considered for standardization. It was a soap prepared from magnesium carbonate, animal fat, and kerosene. Although it was selected for use in early decontaminating devices designed for the Navy due to it being noncorrosive, nontoxic and inexpensive, DR1 proved unsatisfactory as a decontaminant and was never standardized by the Army.[15]

Chlorinating Compound 1 (CC-1)

During the early 1930s, the Chemical Warfare Service made the important discovery of the decontaminating capability of dry decontaminating powder mixed with a solvent. The solvent dissolved both the mustard agent and the dry powder and allowed chemical destruction of the mustard agent to take place while both the mustard agent and the dry powder were dissolved in the solvent. The best solvent was determined to be acetylene tetrachloride. Initially, the most effective dry compound was chloroamide, a light tan-to-white powder, dissolved in acetylene tetrachloride, designated CC1. It was produced only by the Chemical Warfare Service and standardized in 1938 as Non-Corrosive Demustardizing Agent CC No. 1. It was identical with Impregnite CC2 used to make clothing impermeable to chemical agents. CC1 was superior to bleach because it liberated the chlorine more slowly from the mustard agent, which made it less corrosive to metal and destructive to other materials. In 1942, it was redesignated M3 Decontaminating Agent to clarify that it could be used to decontaminate more than just mustard agent. In 1943, CC1 was redesignated substitute standard in favor of RH-195 (M4 Decontaminating Agent), which was cheaper, worked faster, and had a slower rate of deterioration. CC1 was officially obsoleted in 1945.[16]

Continued pg. 16

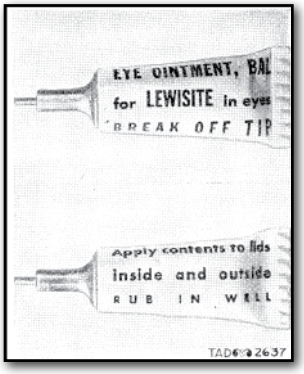
Decontaminating Agent, Non-Corrosive (DANC)

Another dry compound, RH-195, developed by the E. I. du Pont de Nemours Company, when mixed with acetylene tetrachloride was initially thought to be a less effective decontaminant for mustard agent than CC1 Decontaminant. It was classified substitute standard in 1938 when CC1 was standardized. However, the RH-195 decontaminant was later recognized as the more effective of the two and was later designated Decontaminating Agent, Non-Corrosive (DANC). DANC was a whitish powder that liberated chlorine more slowly than ordinary bleaching material and therefore was more stable in storage and could be used on items that would be damaged or destroyed by bleaching powder. It was superior to CC1 because it did not clog spray lines, was less expensive, and stored better. One gallon of DANC could decontaminate 15 square yards of heavily contaminated soil. It was also somewhat effective against biological agents, but was ineffective against nerve agents. DANC was used by all the services for decontamination. In 1942, it was redesignated M4 Decontaminating Agent. It came in 3-gallon and 4.5-gallon containers that contained the RH-195 in the upper section and acetylene tetrachloride in the lower section. Due to the awkward size of the larger container, it was reclassified limited standard in 1952. During World War II, the Army procured over one million of the 4.5-gallon containers and over 58,000 of the 3-gallon containers of DANC. By the 1950s, the problems with DANC were that it was not non-corrosive, it was unsuitable for long-term storage, and the acetylene tetrachloride was extremely toxic. The Army stopped procurement of DANC in 1958 and it was obsoleted in 1972.[17]

Protective Ointments as Decontaminants

After World War I, the Army continued research on finding protective ointments that would prevent mustard burns as well as lessen the effect of the agent after exposure. Researchers examined numerous compounds in cooperation with the Medical Corps, but none met all the requirements for standardization.[18]

British Anti-Lewisite (BAL) Ointment



Prior to World War II, the British utilized German research to develop an ointment that neutralized lewisite on the skin. Known as British Anti-Lewisite (BAL), it was an oily, colorless liquid with a strong odor. BAL reacted with the arsenic in lewisite and changed it to a nontoxic, water-soluble substance. The U.S. Army and several universities modified BAL specifically to neutralize lewisite in and around eyes and gave it a new chemical name, Dimercaprol Ointment, although it continued to be known as BAL Eye Ointment. Dimercaprol Ointment consisted of polyethylene glycol, ethylene glycol, boric acid, ascorbic acid, thiamine hydrochloride, and BAL. During World War II, it was issued in a small tube as part of the M5 Protective Ointment Kit and after the war in later versions of the kit. In 1960, the BAL Eye ointment tube was dropped from the kits due to the lack of perceived threat of a lewisite attack and to the fact that eye decontamination would take too long and prevent quick masking.[19]

Decontaminating Equipment

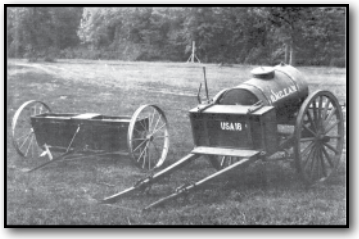
Early Decontamination Sprayer

During the 1920s, very little work was done on developing a decontaminating device. Buckets, shovels, and brooms used during World War I remained the normal way of spreading bleach on contaminated soil. In 1929, the Army developed a demustardizing sprayer that consisted of a 10-gallon pressure tank and spray hose. Air, supplied by an external source, forced a mixture of bleaching powder and carbon tetrachloride out of a nozzle. The unit was field tested by decontaminating a truck, but was never standardized.[20]

Early Decontaminating Devices for the Navy

Due to problems with using bleach on ships, the Army was asked to develop devices suitable for spraying a decontaminant on the decks and metal surfaces of a ship. This project, conducted between 1930-1933, led to the design of early decontaminating devices. Under this project, DR1 decontaminant was developed and selected as the decontaminant of choice. To disseminate the DR1, the Army initially designed a simple 2-gallon pressure tank that used steam and air to spray the DR1. In 1930, the E1R1 apparatus was tested only in the laboratory and was never fielded. The second version, designated the E1R2 (see photograph) increased the tank to 20 gallons. This unit was field tested on the U.S.S. Eagle in 1932, but received negative reviews for being too slow. Additional development work failed to turn up a good device for use with DR1 and the DR1 program was discontinued.[21]

Large-Scale Decontaminating Devices

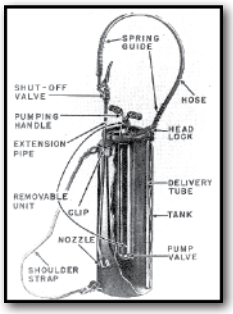


The need to spread bleach over a large area led the Army to examine various commercially available spreaders during the 1930s. These included agricultural lime spreaders and road water sprinklers, most of which proved unsuccessful at disseminating the proper amount of decontaminant. In 1935, the Army began investigating truck-mounted commercial orchard sprayers for spreading bleach. The best design used a 300-gallon tank and an 8-horsepower engine mounted on a gun carriage. The unit included a rotary agitator for mixing the bleach with water and CC1 decontaminant.[22]

Continued pg. 17

History *cont.*

M1 Decontaminating Apparatus



Throughout the 1930s, the Army experimented with various commercial hand-held insecticide sprayers to decontaminate vehicles and equipment in the field. Of those examined, the best sprayer was the Open-Hed No. 4, manufactured by the E. C. Brown Company of Rochester, New York. Designated the E3R4, it was field tested at Langley Field, Virginia, in 1938, and later that same year standardized as the 3-gallon Demustardizing Apparatus, Commercial Type. It consisted of a heavy galvanized steel tank with a hand-operated air pump, a two-foot rubber hose, a two-foot brass nozzle assembly, and a carrying strap. When full, the unit weighed 72 pounds and could decontaminate about 50 square yards. CC1 was the initial decontaminant used in the device, but DANC and bleach suspensions were also used. In 1942, it was officially redesignated the M1 3-Gallon Decontaminating Apparatus to indicate that the unit could be used on other persistent agents besides mustard agent. During World War II, 287,767 units were procured for the Army. During the Korean War, an additional 49,866 units were procured for the Army, 12,121 units for the Air Force, and 360 units for the Navy. In 1956, the Army canceled the requirement for the M1 and replaced it with a bucket and broom to disseminate small amounts of decontaminant. The Navy and Air Force, however, kept their requirement. In 1968, the M1 was replaced by the M11 Decontaminating Apparatus and was obsoleted.[23]

Endnotes

14. CWTC 23, 27 Sep 38; CWTC 312, 1 Apr 41; CWTC 953, 17 Mar 44; CWTC 1463, 4 Oct 45.
15. Mankowich, 1:34-36, 41, 55.
16. CWTC 23, 27 Sep 38; CWTC 1458, 4 Oct 45.
17. CWTC 23, 27 Sep 38; Army Materiel Command Type Classification (AMCTC) 9680, 19 Jun 72; Technical Manual (TM) 3-500, *Chemical Corps Equipment Data Sheets,* 1961, 128-129; TM 750-5-15, *Chemical Weapons and Defense Equipment,* 1972, Change 3, 397; Chemical Warfare Service, *Report of Production, 1 January 1940 through 31 December 1945* (undated), 1.
18. CWTC 166, 12 Jul 40.
19. Chemical Corps Technical Committee (CCTC) 2168, 25 Aug 50; CCTC 3769, 15 Aug 60.
20. Mankowich, 1:39, 41.
21. Ibid., 1:41-55.
22. Ibid., 1:69-76.
23. CWTC 33, 7 Oct 38; CWTC 487, 17 Mar 42; AMCTC 6299, 23 Jul 68; Mankowich, 1:58, 90.

DTIC Launches DoDTechipedia

The Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L) announces the launch of DoDTechipedia, an initiative of the Defense Technical Information Center (DTIC®), at the direction of the Director of Defense Research and Engineering (DDR&E). A DoD scientific and technical wiki, DoDTechipedia is designed to increase communication and collaboration among DoD scientists, engineers, program managers and operational warfighters. This tool will enable DoD personnel to collaborate on technological solutions, reduce costs, add capability and avoid duplication. DoDTechipedia will aid in the rapid development of technology and the discovery of innovative solutions to meet critical capability needs and gaps.

Creating a valuable source of information requires input. Share your knowledge, assist a colleague, ask a question, post an event, start a blog to and be part of the development of the DoD's first knowledge network. To ensure that the most advanced technologies reach the warfighter tomorrow, collaborate on DoDTechipedia today.

Visit DoDTechipedia at https://www.DoDTechipedia.mil.

In the News

New Unified Command Plan Spells Out Responsibilities, Missions

Donna Miles

American Forces Press Service

December 23, 2008

"President George W. Bush has signed an updated unified command plan that codifies U.S. Africa Command…The plan codifies a new "pandemic influenza" mission and tasks Northcom to plan department-wide efforts in support of the U.S. government response to an outbreak…U.S. Special Operations Command is assigned responsibility for global operations against terrorist networks, and Stratcom becomes responsible for combating weapons of mass destruction and global missile defense."

http://www.defenselink.mil/news/newsarticle.aspx?id=52450

Clothing That Destroys Chemical Weapons

Yun Xie

Nobel Intent

December 15, 2008

"…Chemically modified clothing could be a more effective form of protection… Keller and his colleagues chose a system that utilizes solar energy to catalyze reactions. By using layer-by-layer deposition, they were able to create a homogenous and thin layer of nanotube material (titanate nanotubes impregnated with tungstate salt) atop mundane textile fibers."

http://arstechnica.com/journals/science.ars/2008/12/15/clothing-that-destroys-warfare-chemicals

Claflin Research Seeks Easy Way to Detect Threats

Lee Tant

The Times and Democrat

December 01, 2008

"Claflin University researchers will soon begin developing a thin strip of paper that can detect the presence of biological outbreaks and chemical weapons."

http://www.thetandd.com/articles/2008/12/01/news/doc493375986b350239173536.txt

Data Published in Nature Medicine Highlights Ability of Peregrine Pharmaceuticals' Bavituximab to Cure Lethal Virus Infections

Peregrine Pharmaceuticals, Inc.

November 24, 2008

"Peregrine Pharmaceuticals, Inc. today reported publication of data in Nature Medicine that supports the broad antiviral potential of the company's novel anti-phosphatidylserine (anti-PS) antibody platform, showing that its PS-targeting drug bavituximab can cure lethal virus infections in animal disease models."

http://ir.peregrineinc.com/releasedetail.cfm?ReleaseID=350289

Scientists Build 'Roach Motel' For Nasty Bugs of the Bacterial Variety

Aaron Hoover

University of Florida Press Release

November 24, 2008

"Scientists at the University of Florida and the University of New Mexico have created tiny microscopic spheres that trap and kill harmful bacteria…The research could lead to new coatings that will disinfect common surfaces, combat bioterrorism or sterilize medical devices, reducing the devices' responsibility for an estimated 1.4 million infection-related deaths each year."

http://news.ufl.edu/2008/11/24/bacteria-motel/

Nanotech Clothing Fabric 'Never Gets Wet'

Jon Evans

New Scientist

"If you were to soak even your best raincoat underwater for two months it would be wet through at the end of the experience. But a new waterproof material developed by Swiss chemists would be as dry as the day it went in… secret to this incredible water resistance is the layer of silicone nanofilaments…"

http://www.newscientist.com/article/dn16126-nanotech-clothing-fabric-never-gets-wet.html

Researchers Identify Blood Component That Turns Bacteria Virulent

Anna Sobkowski

The Scripps Research Institute News

November 24, 2008

"Scientists from the Scripps Research Institute have discovered the key chemical that signals *Bacillus anthracis*, the bacterium that causes anthrax, to become lethal."

http://www.scripps.edu/newsandviews/e_20081124/perego.html

Vol. 6 No. 1 of the Chem-Bio Defense Quarterly Magazine is Now Available!

While traditionally the Chem-Bio Defense community has dealt with "ions, not electrons," this is changing rapidly. Today, virtually every commodity area within the JPEO-CBD depends on information technology, whether it is central to a Program of Record or those tools used to perform logistics and administrative functions. With this ever-growing dependency upon information technologies, everyone now finds themselves, to some degree, in the "electron" business. This issue of Chem-Bio Defense Quarterly magazine looks at initiatives central to Joint Project Manager Information Systems.

To view the electronic version, visit: http://www.jpeocbd.osd.mil/packs/Default.aspx?pg=420

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All products are unclassified unless otherwise noted.

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2009 CBRNIAC Products *continued*

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CBRNIAC Co-Hosts Technical Forum on Trends in CBRN Field Analytics

On December 9, 2008, the Chemical, Biological, Radiological and Nuclear Defense Information Center (CBRNIAC) hosted a Technical Forum on "Trends in CBRN Field Analytics" from 8:00 a.m. to 3:30 p.m. at the Strategic Analysis Executive Conference Center in Arlington, Virginia. Co-hosted by the Joint Requirements Office for Chemical, Biological, Radiological and Nuclear (JRO-CBRN) Defense, the forum featured subject matter experts (SMEs) in the areas of chemical, biological, radiological and nuclear (CBRN) field analytics. **Dr. James King**, Deputy Director of the CBRNIAC welcomed participants and attendees. **LTC Brett Crozier**, of the JRO-CBRN Defense, offered opening remarks.

Chemical Analytics in the Field

Angela Ervin, Ph.D., Program Manager
Chemical Countermeasures, Science and Technology Directorate
Department of Homeland Security

Dr. Angela Ervin manages two key chemical detector projects in the Department of Homeland Security (DHS) Science & Technology (S&T) Directorate: the Automated Rapid Facility Chemical Agent Monitor (ARFCAM) and the Low-weight Autonomous Chemical Information System (LACIS) Projects. Her presentation, *DHS S&T Chemical Detection Program*, highlighted these two programs which are part of DHS S&T Chemical Detection Program.

Dr. James Peterson, CBRNIAC SME
Battelle Eastern Science and Technology Center

Dr. James Peterson's presentation, *Detection of Hazardous Reactive Chemicals Using Solid Phase Microextraction and Ultra-Fast Gas Chromatography-Mass Spectrometry*, discussed the advantages and disadvantages of a high-throughput mobile lab system designed to meet the DHS requirement for a rapidly deployable mobile laboratory system capable of analyzing up to 1,000 samples per day to identify chemically contaminated areas. Three ultra-fast, sensitive gas chromatography/time-of-flight mass spectrometry (GC/TOF-MS) instruments were combined with solventless solid phase micro-extraction (SPME) sample preparation. The desired system had to be capable of detecting the traditional chemical warfare blood, vesicant, nerve, choking, and blister agents as well as toxic industrial chemicals (TICs) at levels equivalent to Environmental Protection Agency (EPA) permissible exposure limits in air.

Biological Analytics in the Field

Douglas Anders, Ph.D., Science Program Coordinator
Laboratory Division's Hazardous Materials Response Unit
Federal Bureau of Investigation

Dr. Douglas Anders described the establishment of the Federal Bureau of Investigation (FBI) Hazardous Materials Response Unit (HMRU) CBRN scientific response capabilities in his presentation, *Evolution of the Federal Bureau of Investigation's Forensic Analysis Capability for CBRN Materials*. The HMRU provides a scientific and technical response capability to support investigations of crimes involving weapons of mass destruction (WMD) and other hazardous materials.

Charles DeSanti, Ph.D., CBRNIAC SME
Battelle Memorial Institute

Dr. Charles DeSanti spoke about *Field Bioanalysis*, which involves the execution of biological analyses in non-fixed facilities, either mobile laboratories or mobile systems. He pointed out that key design elements should always be considered when establishing such a system: Analytic Technology, Contamination Control, Quality Control and Assurance, Chain of Custody, Preservation of Evidence, Proficiency Testing, Decision Rules, System Sensitivity, False Positive Rate, Sample Throughput, and Multi-Hazard Robustness. Four examples of different field bioanalysis projects were presented and discussed in the context of these key bioanalytical system design elements.

Radiological/Nuclear Analytics in the Field

George Brooks, M.S.
Nuclear and Radiochemistry Group
Los Alamos National Laboratory

Mr. George Brooks spoke on *Field Analytics in Support of the National Technical Nuclear Forensics (NTNF) Program – Post Detonation/IND*. The collection and subsequent analysis of samples in the field is paramount and a critical component of the NTNF process. Without samples of adequate quantity and quality, the remainder of the analytical and assessment process will be challenged. Mr. Brooks provided an overview of field processes associated with an NTNF post-detonation response to a nuclear yield event. His presentation included a brief history of why the samples are collected, what analytical constituents are measured and why, the analytical systems in use, and a look forward to the future of field NTNF response.

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Joseph Jacobsen, CBRNIAC SME
Battelle Memorial Institute

Mr. Joseph Jacobsen discussed the purposes of using field detection equipment at radiological/nuclear(R/N) controlled or incident sites in his presentation, *Purposes for Using Radiological/Nuclear Field Deployed Detection Equipment*. He drew upon his experience working on Nuclear Regulatory Commission (NRC)-, the Department of Energy (DOE)-, and Environmental Protection Agency (EPA)-regulated work sites with monitoring and assessment of radiological source terms. Mr. Jacobsen cited specific examples of successful field monitoring equipment currently being deployed and addressed gaps that still exist in the use of field monitoring equipment and the efforts currently underway to fill those gaps.

Kevin Carney, Ph.D.
Nuclear Nonproliferation Division
National and Homeland Security Directorate
Idaho National Laboratory

Dr. Kevin Carney gave a presentation on *Radiological Dispersal Device Material Forensics*, in which he discussed the numerous challenges to investigators that must determine the origin of the material used in the device (point of loss of control). Dr. Carney discussed the questions to be answered associated with the source materials, potential information that may be signatures associated with radiological materials, the information contained in databases used to trace material origin and field characterization and collections methodologies that are under development.

The Forum ended with closing thoughts and comments by LTC Robert von Tersch, PhD, of the JRO-CBRND.

About the Subject Matter Experts

Dr. Angela Ervin is employed by the DHS as a Program Manager for various chemical and biological countermeasures projects within the S&T Directorate. Dr. Ervin manages the two key chemical detector projects, ARFCAM and LACIS Projects. Dr. Ervin received her Ph.D. in chemistry from The George Washington University, an M.S. in chemistry from Villanova University, and a B.S. in biology from Villanova University.

Dr. Jim Peterson is currently employed at the Battelle Eastern Science and Technology Center in Aberdeen, MD. He has more than 24 years of trace analysis development experience and more than 20 years of analytical laboratory management experience. Dr. Peterson led a team of scientists and systems engineers to design a high-throughput mobile laboratory for the Department of Homeland Security capable of analyzing 1,000 samples per day. He has also supervised mobile lab operations supporting the FBI, the National Guard, the U.S. Marines and the Edgewood Chemical and Biological Forensic Analytical Center. Dr. Peterson obtained his Ph.D. in analytical chemistry at the University of Maryland.

Dr. Douglas Anders, the Science Program Coordinator in the FBI Laboratory Division's HMRU, manages the HMRU's CBRN scientific response capabilities. Dr. Anders received his Ph.D. in microbiology and immunology from the Medical College of Virginia campus of Virginia Commonwealth University (VCU) in 1993. He trained as a post-doctoral fellow in microbiology and immunology in the Department of Pharmacology and Toxicology at VCU where he received the Sir Edmund Black Award for Outstanding Postdoctoral Research in 1999. In recognition of his contributions to the anthrax mailing investigation, Dr. Anders was a 2002 recipient of the FBI Director's Award for Technical/Scientific Advancement. He serves on several interagency committees and working groups, and has served as a technical liaison to the Centers for Disease Control and Prevention's (CDC's) Laboratory Response Network program since 1999.

Dr. Charles DeSanti has 16 years of experience in the theory and practice of life science research, including nine years of industrial experience. Dr. DeSanti has been active in biological analysis and microbial science programs in various capacities, including contamination control, principal investigator, and project management roles. His experiences include participation in and leadership of projects involving: trace biological analysis, method validation, biological processing, genetic engineering, standards management and curation, technology transfer, and theoretical technology assessments. Dr. DeSanti has authored numerous reports and publications, and holds several U.S. patents in the area of biotechnology. Dr. DeSanti holds a Ph.D. in microbiology from Ohio State University.

Mr. Joseph Jacobsen has over 25 years of combined experience in the areas of radiation protection, radioactive/ hazardous waste management, and radiological remediation project management. Mr. Jacobsen has served as Radiological Controls Technician/ Supervisor/Operations Manager, Radiological Technical Support Manager, as well as Radiation Safety Officer (RSO) under the Nuclear Regulatory Commision (NRC) decommissioning license and Assistant RSO under an NRC Agreement State license. He has also served as a primary point of contact working with NRC and DOE regulators/ oversight personnel as well as various disciplines of on site work staff.

Mr. George Brooks received his M.S. in radioecology/radiochemistry from San Jose State University. He has more than 25 years experience in environmental radiochemistry, threat reduction, R/N emergency response and Intelligence program activities. Mr. Brooks is currently the Deputy Group Leader of the Nuclear and Radiochemistry Group at Los Alamos, Senior Project leader for R/N Forensics within the DHS/ National Technical Nuclear Forensics Center (NTNFC) program area, and Senior Project leader for R/N NTNF activities within the DOE NA-45, DOD Defense Threat Reduction Agency-Nuclear Threat Directorate and -Combat Support Contingency (DTRA NTD & CSC), and the Intelligence arenas as well. Mr. Brooks is also the Technical Working Chair for the Joint Working Group (JOWOG 29) Nuclear Forensics Users Group.

Dr. Kevin Carney earned his bachelors degree in mathematics and chemistry from the State University of New York College at Potsdam. He completed his Ph.D. in chemistry in 1987 at the University of Vermont. He was a post-doctoral associate at DOE's Ames Laboratory from 1987–1988. Dr. Carney spent 4 years in the chemical industry until he joined Argonne National Laboratory from 1992 through 2006, when he moved to the Idaho National Laboratory (INL). At INL, Dr. Carney has been the technical program lead supporting the DOE NA-45, DTRA and DHS NTNF Programs.

The proceedings from the *Technical Forum on Trends in CBRN Field Analytics* will be developed as a CBRNIAC Information product in the near future.

CBRNIAC TAT Program

The CBRNIAC generates, analyzes and disseminates CBRN Defense Science and Technology Information (STI) and provides Research and Development (R&D) in support of numerous Department of Defense, Department of Homeland Security, federal, state, local government agencies and commercial clients.

The CBRNIAC Technical Area Task (TAT) program offers a means to access unmatched expertise and unique facilities to deliver CBRN Defense solutions. From detection and protection against weapons of mass destruction to emergency preparedness/response and protection of critical infrastructure, the CBRNIAC TAT program offers a convenient and responsive delivery-order contract vehicle to support CBRN needs and requirements. Types of support include:

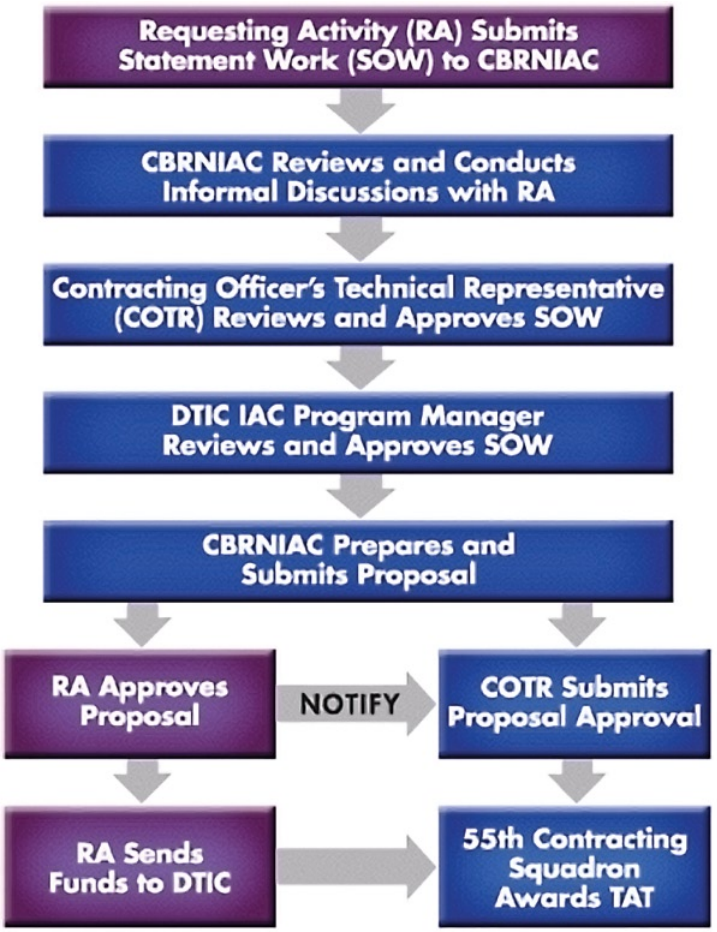
- Studies and Analyses
- Hardware Development
- Technical Subject Matter Expertise
- Training Courses
- Information Collection and Compilation
- Design and Development of Models, Simulations, and Databases
- Support of Conferences, Symposia, Working Groups
- Test and Evaluation of Materials, Components, and Systems
- Laboratory Studies (including Surety work)
- Engineering Design and Prototyping

More than just a deliverables-based contract vehicle, TATs provide valuable R&D solutions to tough CBRN defense and homeland security problems. TATs create new STI which is readily accessible to the CBRN Defense community. This saves resources by encouraging the reuse of STI created through the program.

The CBRNIAC TAT contract features include:

- A pre-competed Cost Plus Fixed Fee Indefinite Quantity (CPFF ID/IQ) with a broad CBRN defense scope.
- No user restrictions - TATs may be sponsored by the Department of Defense and other government agencies, state and local government agencies, academia, and industry.
- Reasonable Rates – DTIC charges a modest 3.5% task support fee.
- Unlimited total task values – TATs can be as small or as large as your research needs require.
- Period of performance of up to 3 years.
- Incremental funding allowed, offering maximum flexibility for your budget cycle.
- Quick Turnaround – New tasks are put on contract simply by adding new delivery orders in 6–8 weeks.
- Ease of use with 3 simple actions – Our clients, identified as the "Requesting Activity" complete the following:
  1) Submit a Statement of Work (SOW)
  2) Approve the proposal
  3) Send funding.
  That's it!

The CBRNIAC contract vehicle supports customers from federal, state and local levels as well as industry and academia.



In order to ensure customer satisfaction, assessments of performance are conducted throughout the life each TAT. Here is what some of our clients have said:

"The turnaround time on this award could not have been better. The 55th Contracting Squadron executed and responded to this task award on short notice and in what must have been a record time. Please keep up the good work!"

"I enjoyed the team approach to the development of the CBRNIAC TAT. [Our program] will be postured for meeting the challenges it faces with the professional support [it is] receiving from this contract award."

"I think this process worked very smoothly. I can't think of anything I would have changed."

"This mechanism provides us an opportunity to be flexible in our mission – and adjust to changing workloads very rapidly. The support we get from CBRNIAC is outstanding."

"It was a pleasure to work with CBRNIAC. Extremely professional, easy to work with, responsive, and helped me a lot."

For more information on TATs, contact Janice Rhodes at cbrniac-tat@battelle.org.

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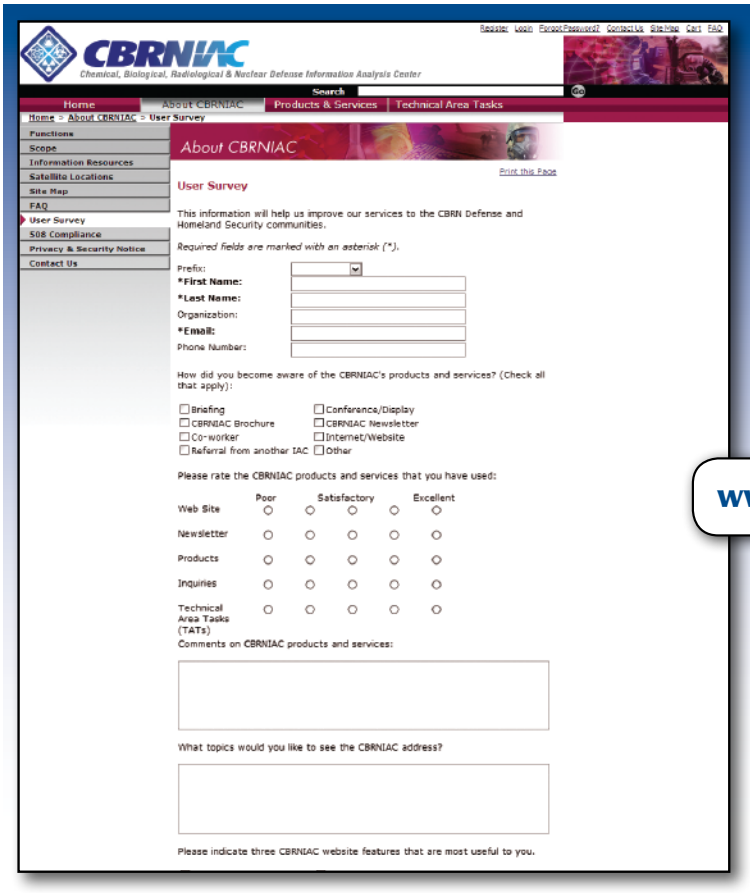

2009 User Survey

In less than a minute you can help us develop CBRN defense information resources of value to our user community by completing our online user survey!

Thank You!

www.cbrniac.apgea.army.mil/About/UserSurvey

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